

71. The Origin of the So-called Cone Potential

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There exists a considerable literature¹⁾⁻⁶⁾ on the so-called cone potential,⁷⁾ but the problem, from where does it originate, has not yet been solved.⁸⁾⁹⁾ The present experiment is devoted primarily to solve this problem by a histological approach, dealing with some characteristics of this potential.

Method. The inverted retina was prepared from a carp eye (*Cyprinus carpio*) described by the author elsewhere.¹⁰⁾ For marking the tip of the ultra-microelectrode, an electrode filled with a saturated lithium-carminic 3 Mol-KCl solution was prepared by the same technique as the usual one filled with 3 Mol-KCl solution. The electrodes with a resistance of about 2 to 5 M Ω were preferred to the present experiments.

After the response was recognized by inserting of this electrode into the retina, a direct current was supplied from 100 volt battery through a Ringer-gelatine bridge to the electrode in such manner that it assumed a negative polarity (Fig. 1). A few granules of carmine could be isolated successfully from the tip of the electrode by a current of 30 μ A flowing for 30 to 60 sec. After repeating this procedure at many points in the retina, the retina was fixed by Bouin solution, and then serial paraffin sections were made by the usual method, without staining.

For the other observations of responses, 3 Mol-KCl filled ultra-microelectrodes with a resistance of 10 to 30 M Ω were used.

Light stimulation was given by a flash bulb with a flash duration of 100 μ sec and an intensity of 30 lumen per sec. Recording and viewing were performed with the aid of a cathod follower D-C amplifier and a two beam oscilloscope system.

Experimental results. In the present experiments 35 specimens, successfully marked by carmine granules, were obtained. Eight of those are illustrated in Fig. 2 together with a diagrammatic representation of the position of the granules in each specimen. In these prep-

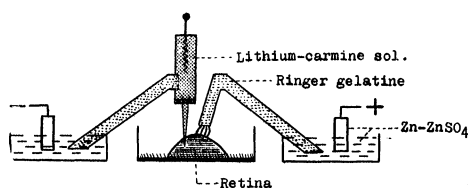


Fig. 1. Diagrammatic representation of the method